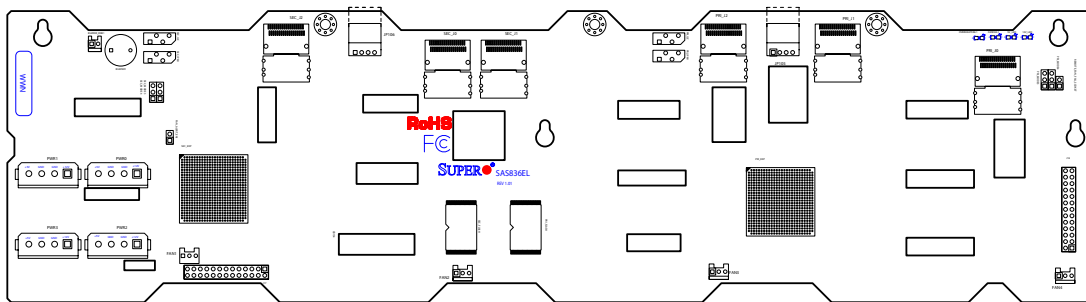




SAS-836EL SERIES BACKPLANE

USER'S GUIDE

Rev. 1.1

The information in this User's Manual has been carefully reviewed and is believed to be accurate. The vendor assumes no responsibility for any inaccuracies that may be contained in this document, makes no commitment to update or to keep current the information in this manual, or to notify any person or organization of the updates. **Please Note: For the most up-to-date version of this manual, please see our web site at www.supermicro.com.**

Super Micro Computer, Inc. ("Supermicro") reserves the right to make changes to the product described in this manual at any time and without notice. This product, including software, if any, and documentation may not, in whole or in part, be copied, photocopied, reproduced, translated or reduced to any medium or machine without prior written consent.

IN NO EVENT WILL SUPERMICRO BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, SPECULATIVE OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OR INABILITY TO USE THIS PRODUCT OR DOCUMENTATION, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN PARTICULAR, SUPERMICRO SHALL NOT HAVE LIABILITY FOR ANY HARDWARE, SOFTWARE, OR DATA STORED OR USED WITH THE PRODUCT, INCLUDING THE COSTS OF REPAIRING, REPLACING, INTEGRATING, INSTALLING OR RECOVERING SUCH HARDWARE, SOFTWARE, OR DATA.

Any disputes arising between manufacturer and customer shall be governed by the laws of Santa Clara County in the State of California, USA. The State of California, County of Santa Clara shall be the exclusive venue for the resolution of any such disputes. Super Micro's total liability for all claims will not exceed the price paid for the hardware product.

FCC Statement: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate"

WARNING: Handling of lead solder materials used in this product may expose you to lead, a chemical known to the State of California to cause birth defects and other reproductive harm.

Manual Revision 1.1
Release Date: April 28, 2008

Unless you request and receive written permission from Super Micro Computer, Inc., you may not copy any part of this document.

Information in this document is subject to change without notice. Other products and companies referred to herein are trademarks or registered trademarks of their respective companies or mark holders.

Copyright © 2008 by Super Micro Computer, Inc.
All rights reserved.
Printed in the United States of America

Table of Contents

SAS-836EL SERIES BACKPLANE

Contacting Supermicro	iv
Returning Merchandise for Service	iii

Chapter 1 Safety Guidelines

1-1 ESD Safety Guidelines	1-1
1-2 General Safety Guidelines	1-1
1-3 An Important Note to Users	1-1

Chapter 2 Jumper Settings and Pin Definitions

2-1 Front Connectors and Jumpers	2-1
2-2 Front Connector and Pin Definitions.....	2-2
2-3 Front Jumper Locations and Pin Definitions.....	2-5
2-4 Rear Connectors and LED Indicators	2-8

Chapter 3 Dual Port and Cascading Configurations

3-1 Single and Dual Port Expanders	3-1
3-2 Failover.....	3-2
3-3 Cables and Chassis Power Card.....	3-3
3-4 Supported Cascading Configurations	3-12

Contacting Supermicro

Headquarters

Address: Super Micro Computer, Inc.
980 Rock Ave.
San Jose, CA 95131 U.S.A.

Tel: +1 (408) 503-8000
Fax: +1 (408) 503-8008
Email: marketing@supermicro.com (General Information)
support@supermicro.com (Technical Support)

W e b
Site: www.supermicro.com

Europe

Address: Super Micro Computer B.V.
Het Sterrenbeeld 28, 5215 ML
's-Hertogenbosch, The Netherlands

Tel: +31 (0) 73-6400390
Fax: +31 (0) 73-6416525
Email: sales@supermicro.nl (General Information)
support@supermicro.nl (Technical Support)
rma@supermicro.nl (Customer Support)

Asia-Pacific

Address: Super Micro Computer, Inc.
4F, No. 232-1, Liancheng Rd.
Chung-Ho 235, Taipei County
Taiwan, R.O.C.

Tel: +886-(2) 8226-3990
Fax: +886-(2) 8226-3991

W e b
Site: www.supermicro.com.tw

Technical Support:
Email: support@supermicro.com.tw
Tel: 886-2-8226-1900

Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

For faster service, RMA authorizations may be requested online (<http://www.supermicro.com/support/rma/>).

Whenever possible, repack the backplane in the original Supermicro box, using the original packaging materials. If these are no longer available, be sure to pack the backplane in an anti-static bag and inside the box. Make sure that there is enough packaging material surrounding the backplane so that it does not become damaged during shipping.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alteration, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Chapter 1

Safety Guidelines

To avoid personal injury and property damage, carefully follow all the safety steps listed below when accessing your system or handling the components.

1-1 ESD Safety Guidelines

Electric Static Discharge (ESD) can damage electronic components. To prevent damage to your system, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing a component from the antistatic bag.
- Handle the RAID card by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the card and peripherals back into their antistatic bags when not in use.

1-2 General Safety Guidelines

- Always disconnect power cables before installing or removing any components from the computer, including the backplane.
- Disconnect the power cable before installing or removing any cables from the backplane.
- Make sure that the backplane is securely and properly installed on the motherboard to prevent damage to the system due to power shortage.

1-3 An Important Note to Users

- All images and layouts shown in this user's guide are based upon the latest PCB Revision available at the time of publishing. The card you have received may or may not look exactly the same as the graphics shown in this manual.

Notes

Chapter 2

Jumper Settings and Pin Definitions

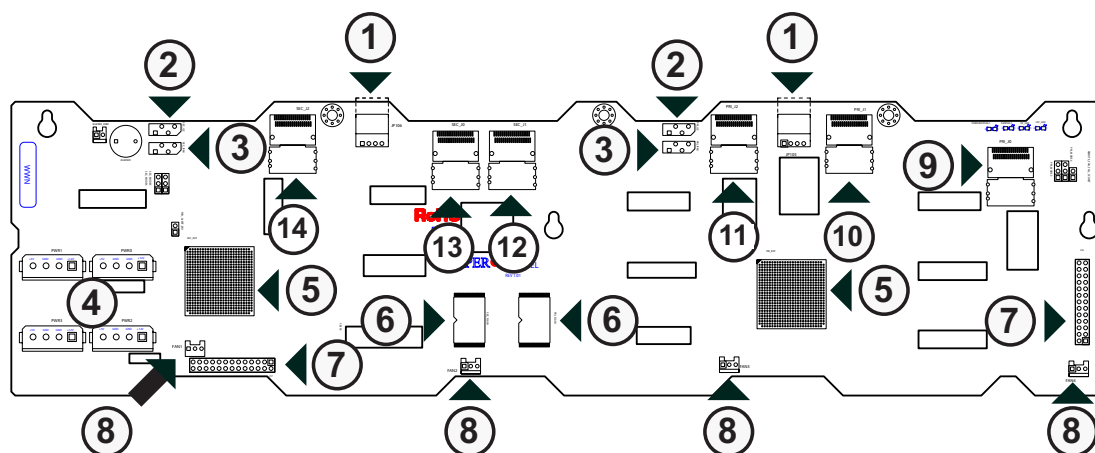


Figure 2-1: SAS-836EL2 Backplane

Front Connectors

- | | |
|---|--|
| 1. CD-ROM/Floppy Drive Power: JP105 and JP106 | Fan4 (Fan1 is not used) |
| 2 and 3. Primary and Secondary I ² C connectors (optional) | 9. SAS Connectors: PRI_J0 |
| 4. Power Connectors: PWR0, PWR1, PWR2, and PWR3 | 10. SAS Connectors: PRI_J1 |
| 5. Primary and Secondary Expander Chip | 11. SAS Connectors: PRI_J2 |
| 6. Primary and Secondary Flash Chip | 12. SAS Connectors: SEC_J1 (not available in EL1 single port backplanes) |
| 7. EPP Connectors: J16 and J17 | 13. SAS Connectors: SEC_J0 (not available in EL1 single port backplanes) |
| 8. Fan Connectors: Fan2, Fan3, and | 14. SAS Connectors: SEC_J2 (not available in EL1 single port backplanes) |

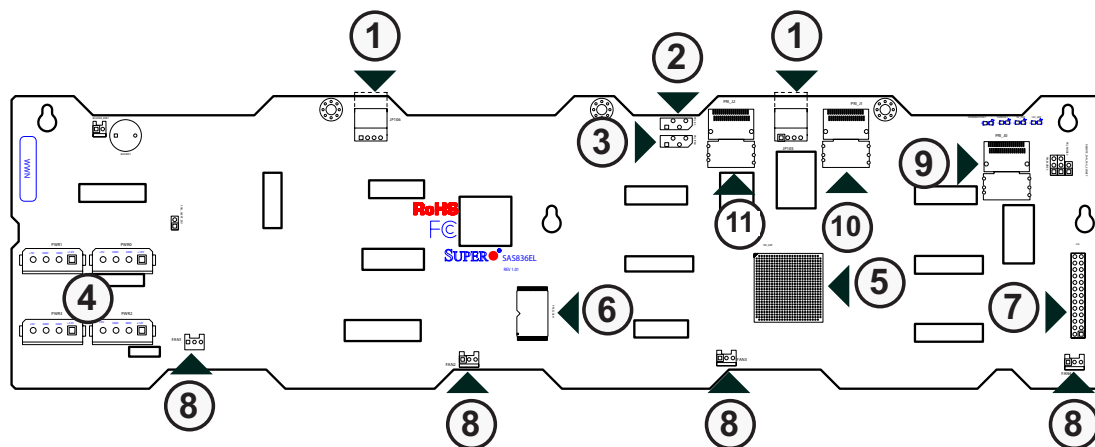


Figure 2-2: SAS-836EL1 Backplane

2-2 Front Connector and Pin Definitions

1. CD-ROM/Floppy 4-Pin Connectors

The 4-pin connectors, designated JP105 and JP106, provide power to the CD-ROM and floppy drives. See the table on the right for pin definitions.

CD-ROM/ FDD Power 4-Pin Connector (JP105 and JP106)	
Pin#	Definition
1	+5V
2 and 3	Ground
4	+12V

2 and 3. Primary and Secondary I²C Connectors

The I²C Connectors are used to monitor hard drive activity and status through LED. See the table on the right for pin definitions. There are four total connectors--two primary and two secondary.

I ² C Connector Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

Note: These connectors are optional and should only be used by qualified technicians.

4. Backplane Main Power Connectors

The 4-pin connectors, designated PWR0, PWR1, PWR2, and PWR3, provide power to the backplane. See the table on the right for pin definitions.

Backplane Main Power 4-Pin Connector (PWR0, PWR1, PWR2, and PWR3)	
Pin#	Definition
1	+12V
2 and 3	Ground
4	+5V

5. Primary and Secondary Expander Chips

This Primary and Secondary Expander Chips allow the backplane to support dual ports, cascading, and failover.

6. Primary and Secondary Flash Chips

The Primary and Secondary Flash Chips enhance the backplane memory.

7. EPP Ports

The EPP ports are used for manufacturer diagnostic purposes only.

8. Fan Connectors

The 3-pin connectors, designated Fan2, Fan3, and Fan4, provide power to the fans.

A fan may be connected to Fan1; however, connector Fan1 is not fully supported by the backplane. Any fan connected to Fan1 will not be monitored.

See the table on the right for pin definitions.

Fan Connectors (Fan1, Fan2, Fan3, and Fan4)	
Pin#	Definition
1	Ground
2	+12V
3	Tachometer

9-14. SAS Ports

Note that the Primary and Secondary sets of SAS ports are in different order. From right to left the ports are Primary 0, 1, 2 and Secondary 1, 0, 2.

2-3 Front Jumper Locations and Pin Definitions

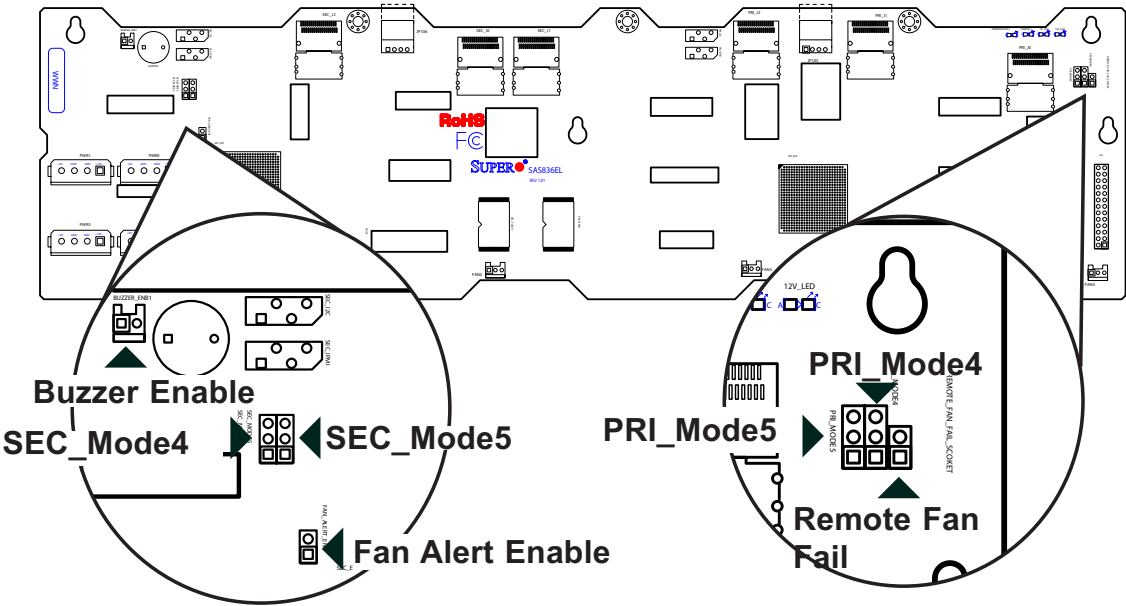
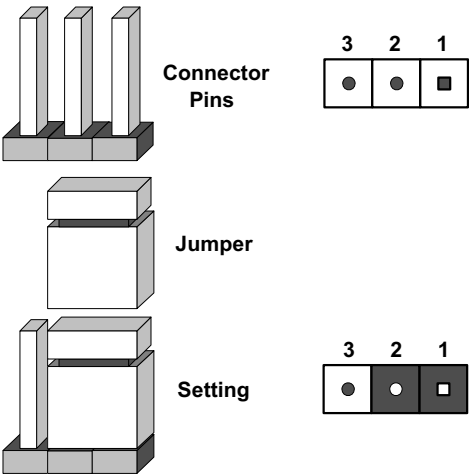


Figure 2-3: Backplane Jumper Settings

Explanation of Jumpers

To modify the operation of the backplane, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. **Note:** On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.



General Jumper Settings		
Jumper	Jumper Settings	Note
PRI_MODE4	1-2	Factory Setting Do not change
PRI_MODE5	2-3	Factory Setting Do not change
SEC_MODE4	1-2	Factory Setting Do not change
SEC_MODE5	2-3	Factory Setting Do not change

General Jumper Settings		
Jumper	Jumper Settings	Note
BUZZER_ENB1	Open: Disable Closed: Enable	Buzzer Enable
FAN_ALERT_ENI	Open: Disable Closed: Enable	Fan Alert Enable

Socket Settings		
Socket	Socket Setting	Note
REMOTE_FAN_FAIL_SOCKET	Connected	Front Panel Fan Fail indicator (Optional)

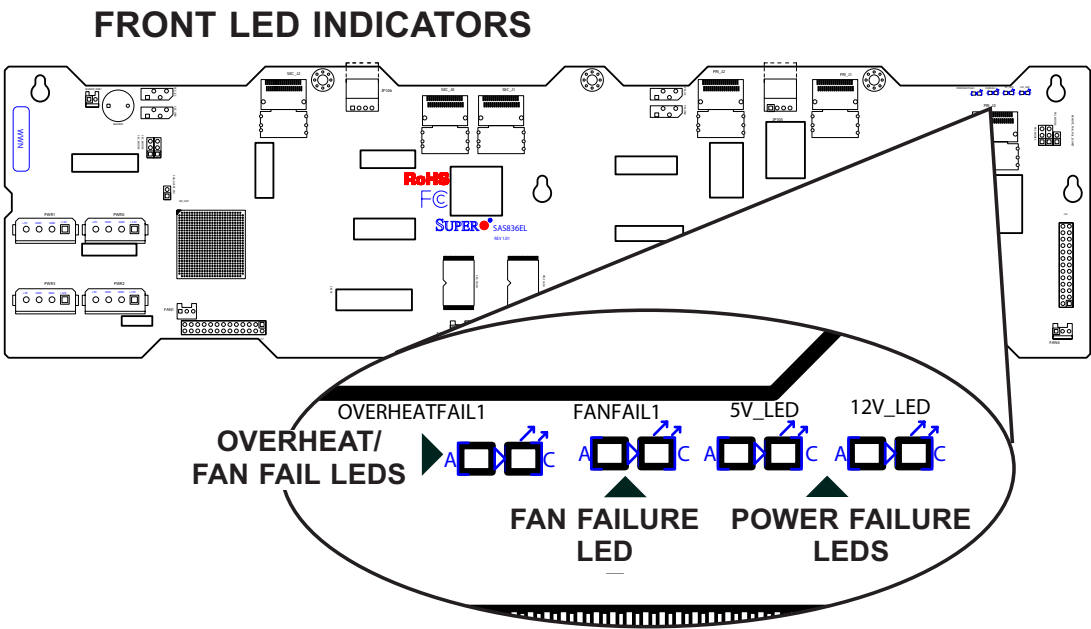


Figure 2-4: Backplane LED Indicators

Backplane LEDs		
LED	STATE	SPECIFICATION
OVERHEATFAIL1	ON	Overheat or Drive Failure
FANFAIL1	ON	Failure in System Fans
5V	OFF	Backplane power failure. Light is on during normal operation.
12V	OFF	Backplane power failure. Light is on during normal operation.

2-4 Rear Connectors and LED Indicators

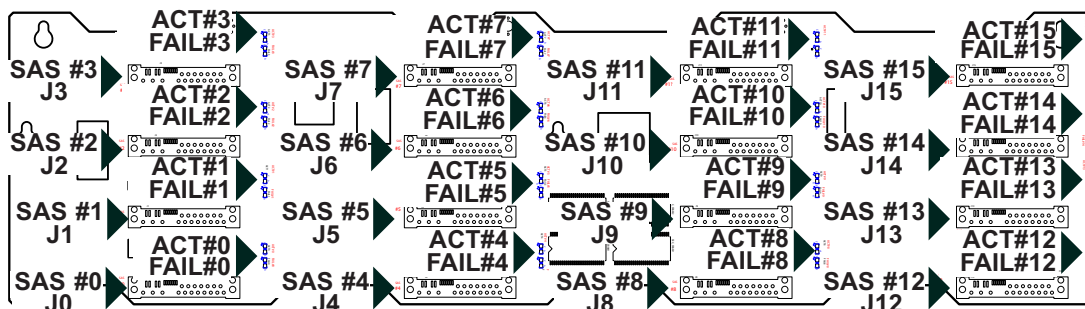


Figure 2-5: Rear Connectors and LED Indicators

Rear SAS Connectors			
Rear Connector	SAS Drive Number	Rear Connector	SAS Drive Number
SAS #0	SAS HDD #0	SAS #8	SAS HDD #8
SAS #1	SAS HDD #1	SAS #9	SAS HDD #9
SAS #2	SAS HDD #2	SAS #10	SAS HDD #10
SAS #3	SAS HDD #3	SAS #11	SAS HDD #11
SAS #4	SAS HDD #4	SAS #12	SAS HDD #12
SAS #5	SAS HDD #5	SAS #13	SAS HDD #13
SAS #6	SAS HDD #6	SAS #14	SAS HDD #14
SAS #7	SAS HDD #7	SAS #15	SAS HDD #15

Rear LED Indicators		
Rear LED	Hard Drive Activity	Failure LED
SAS #0	ACT #0	FAIL #0
SAS #1	ACT #1	FAIL #1
SAS #2	ACT #2	FAIL #2
SAS #3	ACT #3	FAIL #3
SAS #4	ACT #4	FAIL #4
SAS #5	ACT #5	FAIL #5
SAS #6	ACT #6	FAIL #6
SAS #7	ACT #7	FAIL #7
SAS #8	ACT #8	FAIL #8
SAS #9	ACT #9	FAIL #9
SAS #10	ACT #10	FAIL #10

Rear LED Indicators		
SAS #11	ACT #11	FAIL #11
SAS #12	ACT #12	FAIL #12
SAS #13	ACT #13	FAIL #13
SAS #14	ACT #14	FAIL #14
SAS #15	ACT #15	FAIL #15

Chapter 3

Dual Port and Cascading Configurations

3-1 Single and Dual Port Expanders

Single Ports

SAS-836EL1 backplanes have a single-port expander that access all 16 drives and supports cascading.

Dual Ports

SAS-836EL2 backplanes have dual-port expanders that access all 16 drives. These dual-port expanders support cascading, failover, and recovery.

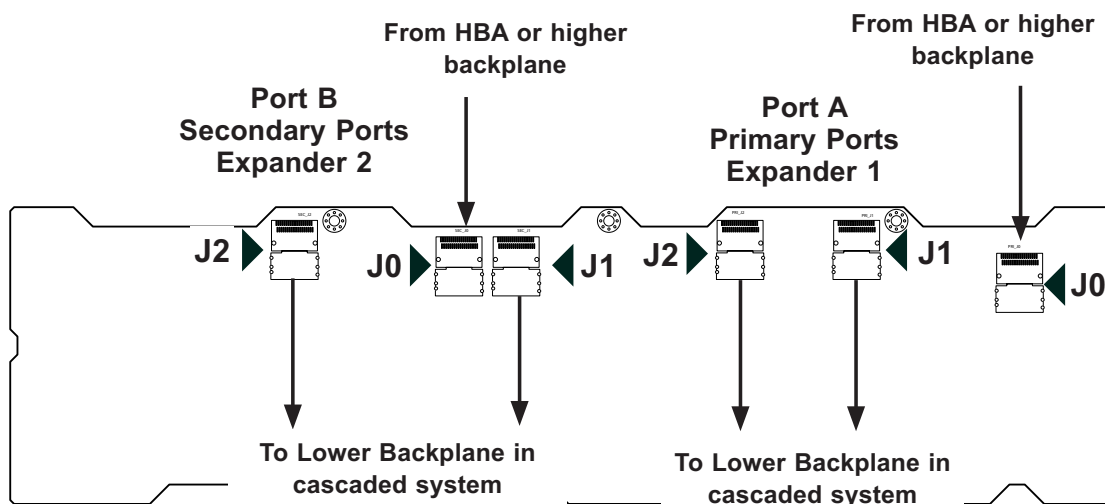


Figure 3-1: SAS-836EL2 Dual Port Configuration

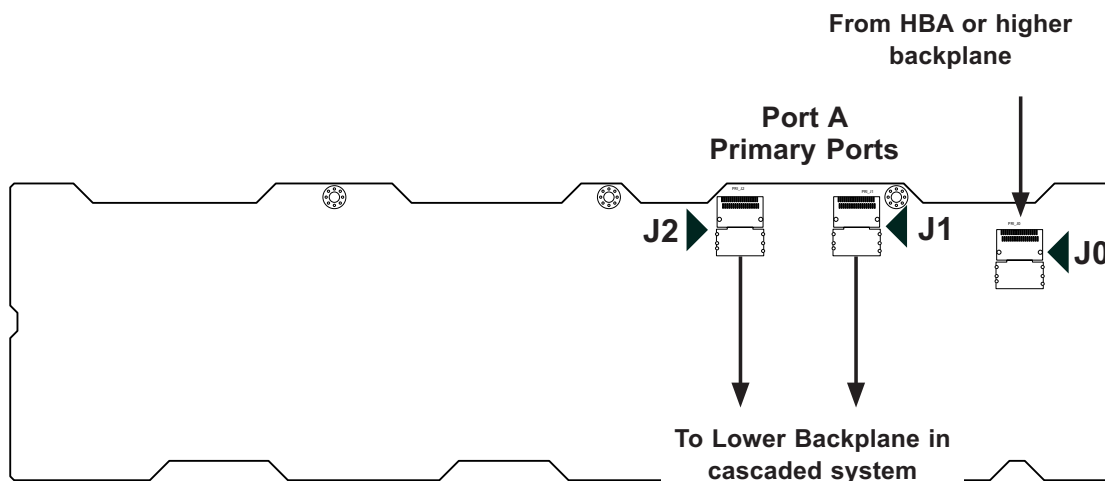


Figure 3-2: SAS-836EL1 Single Port Configuration

3-2 Failover

The SAS-836EL2 backplane has two expanders which allow effective failover and recovery.

Single Host Bus Adapter

In a single host bus configuration, the backplane connects to one Host Bus Adapter (HBA).

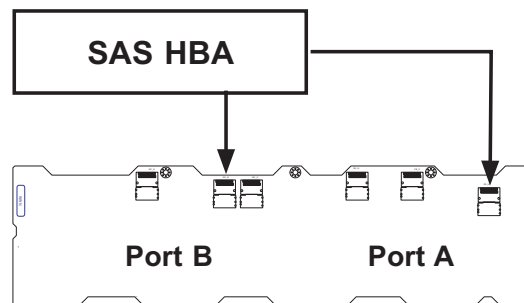


Figure 3-3: Single HBA

Single Host Bus Adapter Failover

If the Expander or data path in Port A fails, the system automatically switches to Port B.

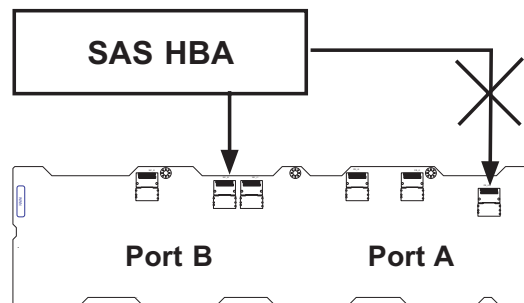


Figure 3-4: Single HBA Failover

Dual Host Bus Adapter

In a Dual Host Bus Configuration, the backplane connects to two Host Bus Adapters (HBA).

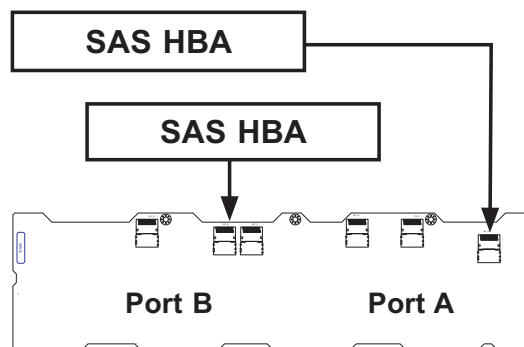


Figure 3-5: Dual HBA

Dual Host Bus Adapter Failover

If the Expander or data path in Port A fails, the system automatically switches to Port B. This maintains a full connection to all drives.

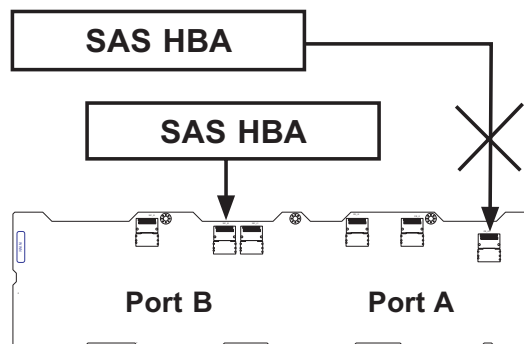


Figure 3-6: Dual HBA Failover

3-3 Cables and Chassis Power Card

Chassis Power Card

In a cascaded configuration, the first chassis includes a motherboard and at least one Host Bus Adapter (HBA). Other servers in this enclosed system, include a power card. This section describes the supported power card for the SAS-836 series backplane.

For more information, see the PCC-JBPWR2 power card manual. This manual can be found at the <http://www.supermicro.com> or as an appendix in the SAS-836EL chassis manual.

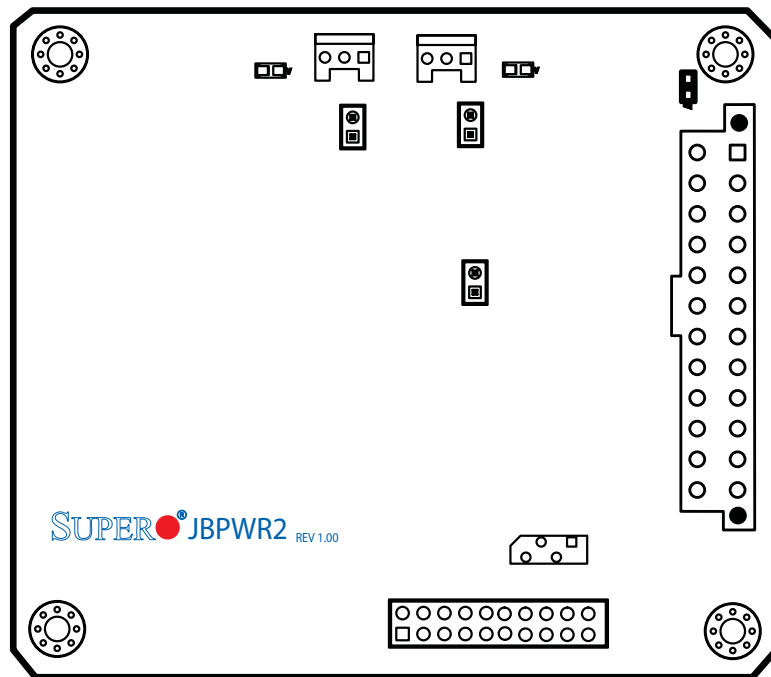


Figure 3-7: Chassis Power Card (Sold Separately)

Power Card		
Part Number	Part Type	Where Used
CSE-PTJBOD-CB1	Power Card	Allows the chassis to be in a JBOD (Just a Bunch of Drives) system.

Connecting an Internal Host Bus Adapter to the Backplane

The following section lists the most common cables used to connect the HBA to the backplane.

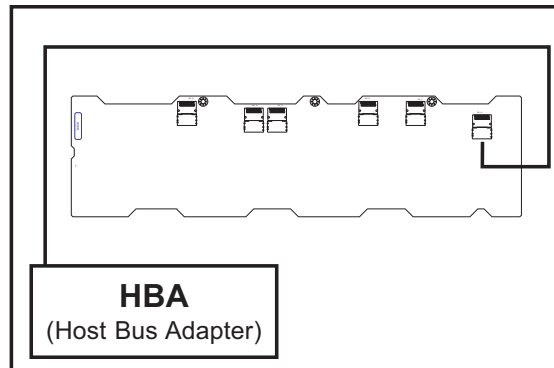


Figure 3-8: Single Internal Host Bus Adapter

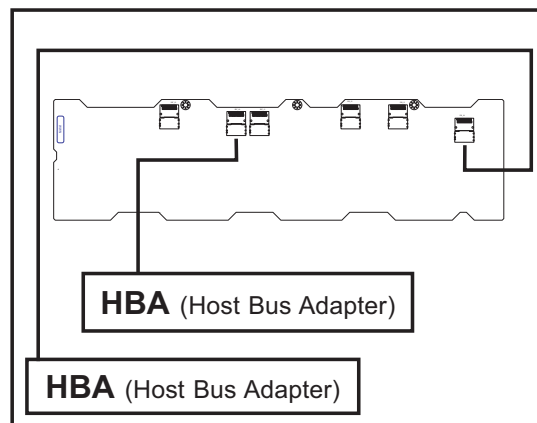


Figure 3-9: Dual Internal Host Bus Adapter

Supported Internal HBA to Backplane Cables

Use the following listed cables to create connections between the internal HBA and SAS-836EL backplane. The cables required depend on the HBA connector.

Cable Name: IPASS TO 4-LANE

Part #: CBL-0117

Length: 46 cm (18 inches)

Description: This cable has one SFF-8484 (32 pin) connector on one end and ipass (SFF-8087/mini-sas) connector (36 pins) at the other. This cable connects from the HBA to the SAS-836EL backplane.

Cable Name: IPASS (mini SAS) TO IPASS (mini SAS)

Part #: CBL-0108L-02

Length: 39 cm (15 inches)

Part #: CBL-0109L-02

Length: 22 cm (9 inches)

Part #: CBL-0110L-02

Length: 18 cm (7 inches)

Description: This cable has an ipass (SFF-8087/mini-sas) connector (36 pins) at each end. It connects from the HBA to the SAS-836EL backplane.

Connecting an External Host Bus Adapter to the Backplane

This backplane supports external Host Bus Adapters. In this configuration, the HBA and the backplane are in different physical chassis. This allows a JBOD (Just a Bunch Of Drives) configuration from an existing system.

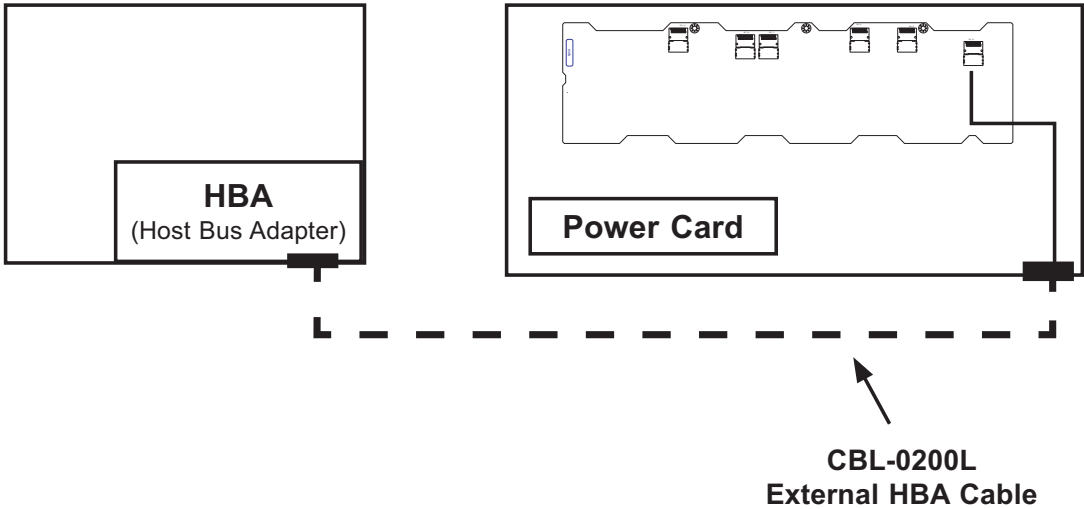


Figure 3-10: Single External Host Adapter

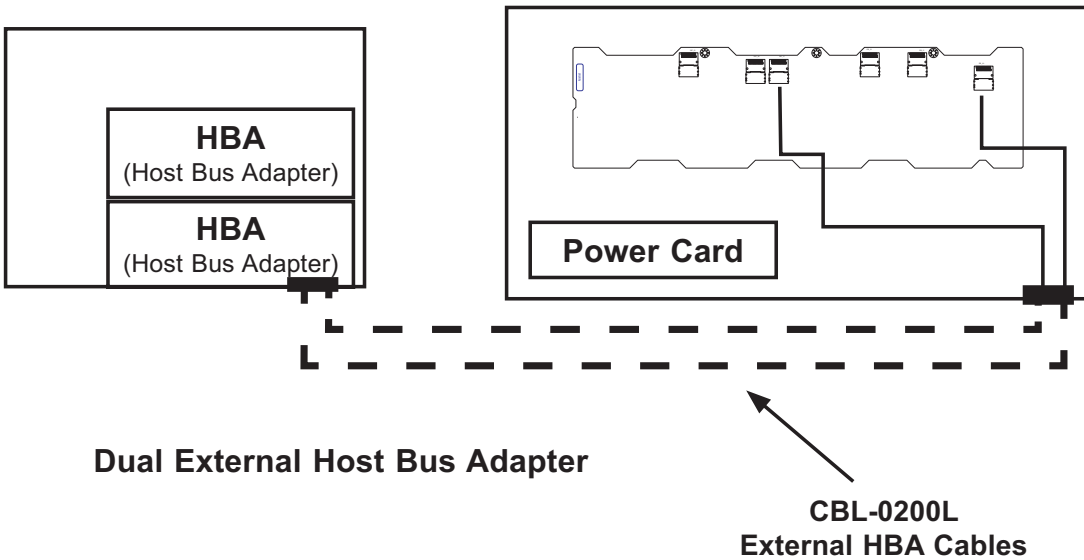


Figure 3-11: Dual External Host Bus Adapter

Supported External HBA to Backplane Cable

Use the following cable if your external HBA has an InfiniBand connector.



Figure 3-12: SAS InfiniBand Cable (CBL-0200L)

Cable Name: SAS InfiniBand to Mini SAS X4 1M cable, PBF

Part #: CBL-0200L

Length: 1 meter

Description: This cable has an InfiniBand connector (SFF-8470) on one end and an SFF-8088-1X (26-pins) at the other end.

Connecting Multiple Backplanes in a Single Channel Environment

This section describes the cables used when cascading from a single HBA. These connections use CBL-0167L internal cables and CBL-0166L external cables.

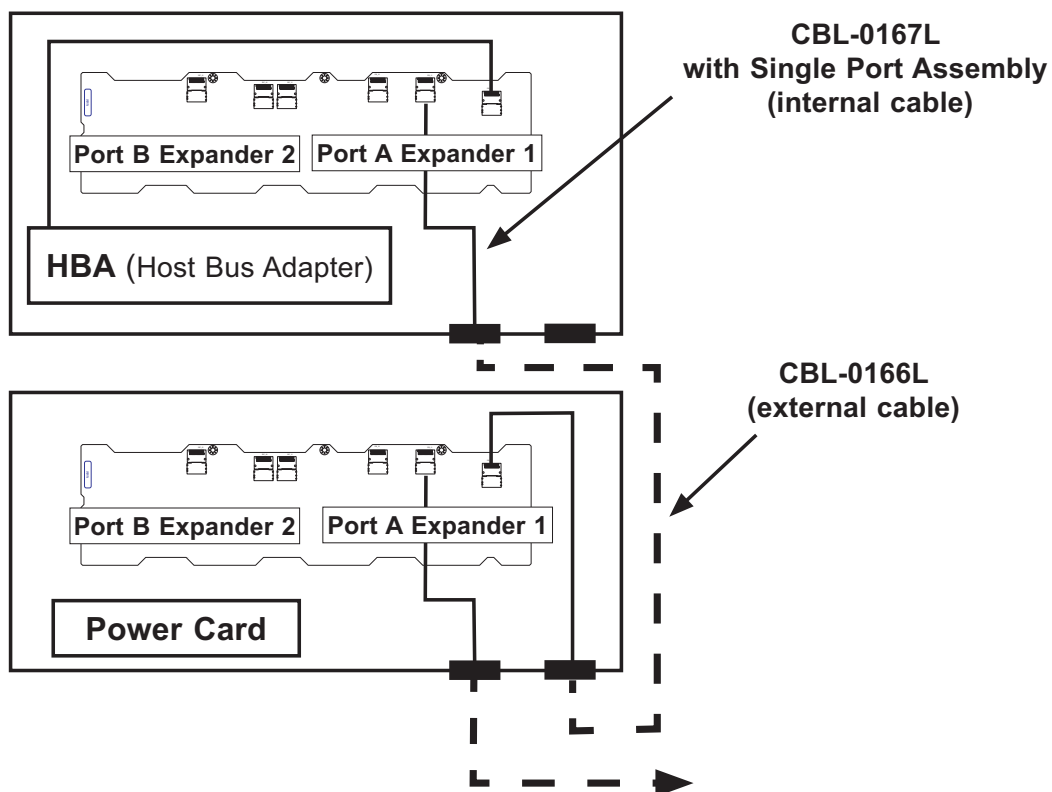


Figure 3-13: Single HBA Configuration

Single HBA Configuration Cables

Single Port Cable Assembly

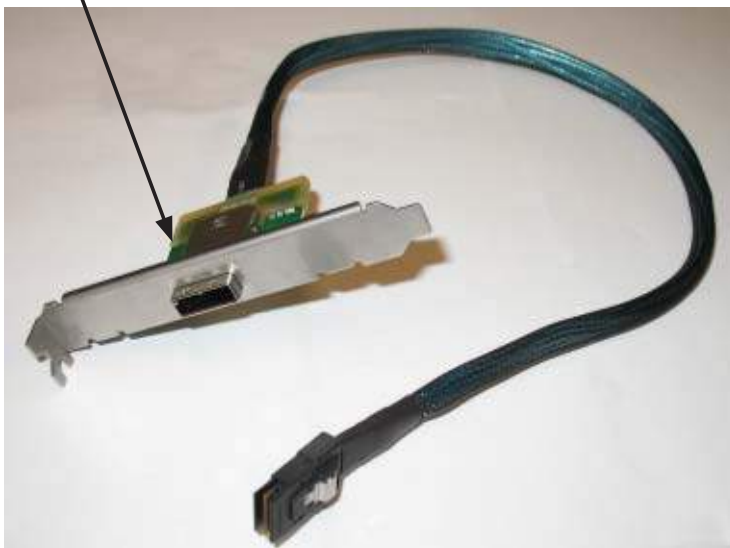


Figure 3-14: Single Port Internal Cable (CBL-167L)

Cable Name: SAS EL2/EL1 Backplane Cable (Internal) with 2-port Cascading Cable, 68 cm

Part #: CBL-0167L (SFF-8087 to SFF-8088 x1)

Ports: Single

Placement: Internal cable

Description: Internal cable. Connects the backplane to the Host Bus Adapter (HBA) or external port. Used in single port environments.



Figure 3-15: External Cable (CBL-166L)

Cable Name: SAS EL2/EL1 Cascading Cable (External), 68cm

Part #: CBL-0166L (SFF-8088 1x to SFF-8088 x1)

Ports: Single or Dual

Placement: External cable

Description: External cascading cable. Connects ports between servers. With most connectors, use one cable for single port connections and two cables for dual port connections.

Connecting Multiple Backplanes in a Dual Channel Environment

This section describes the cables used when cascading from dual HBAs. These connections use CBL-0168L internal cables and CBL-0166L external cables.

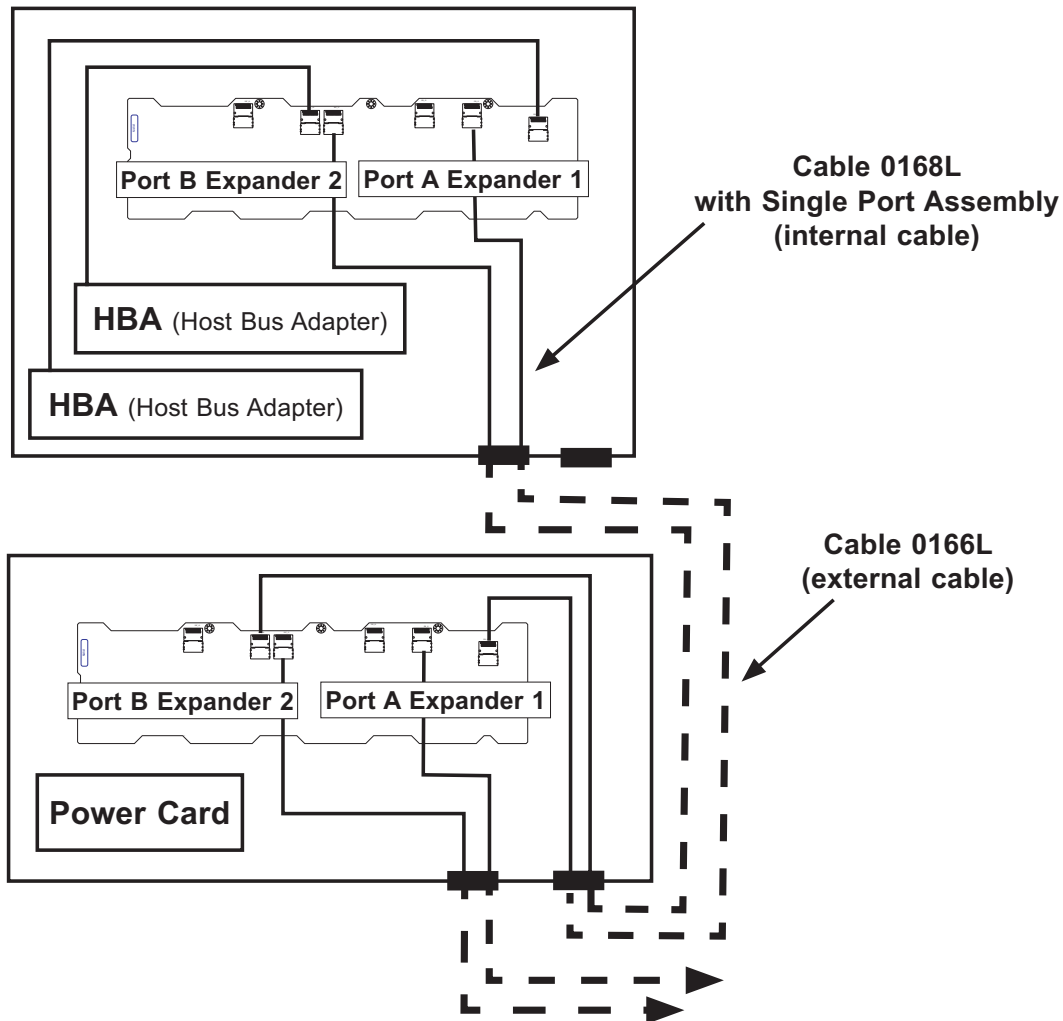


Figure 3-16: Dual HBA Configuration

Dual HBA Configuration Cables

Dual Port Cable
Assembly



Figure 3-17: Dual Port Internal Cable (CBL-168L)

Cable Name: SAS Dual-port Cable Assembly, 68/76cm

Part #: CBL-0168L

Placement: Internal cable

Ports: Dual

Description: Internal cascading cable. Connects the backplane to the Host Bus Adapter (HBA) or external port. Used in dual port environments.



Figure 3-18: External Cable (CBL-166L)

Cable Name: SAS EL2/EL1 Cascading Cable (External), 68cm

Part #: CBL-0166L

Placement: External cable

Ports: Single or Dual

Description: External cascading cable. Connects ports between servers. Use one cable for single port connections and two cables for dual port connections.

3-4 Supported Cascading Configurations

Cascading allows the system to access data at a faster rate by allowing several backplanes to share resources to reduce latency time.

The first backplane in a cascaded system requires a motherboard and HBA. Other servers require a power control card with no motherboard and no HBA. For more information, see the SC836 Chassis Manual available at www.supermicro.com.

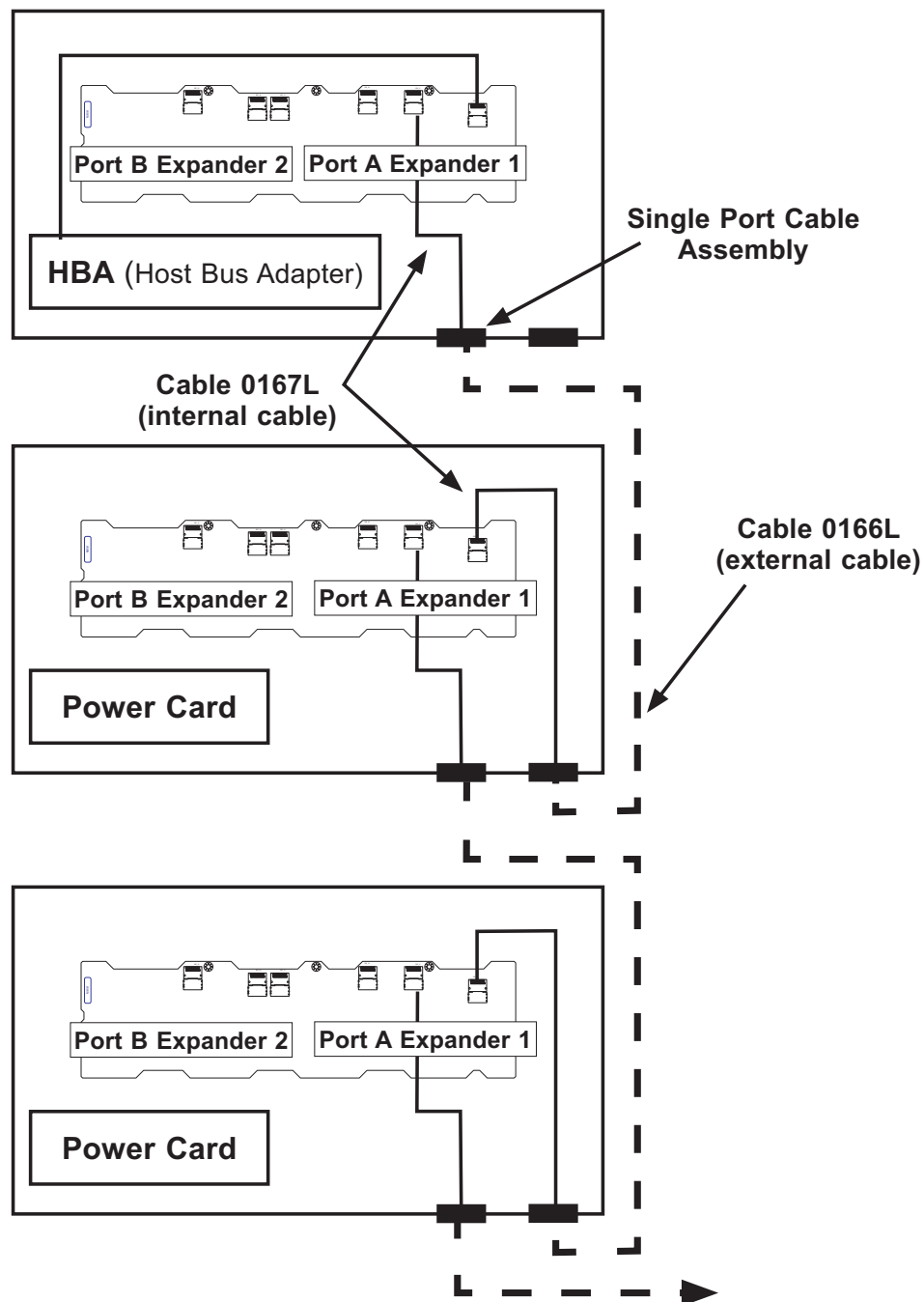


Figure 3-19: Simple Cascaded Configuration

Server System with Single SAS HBA

The expanders allow horizontal branching. This configuration also applies to dual ports.

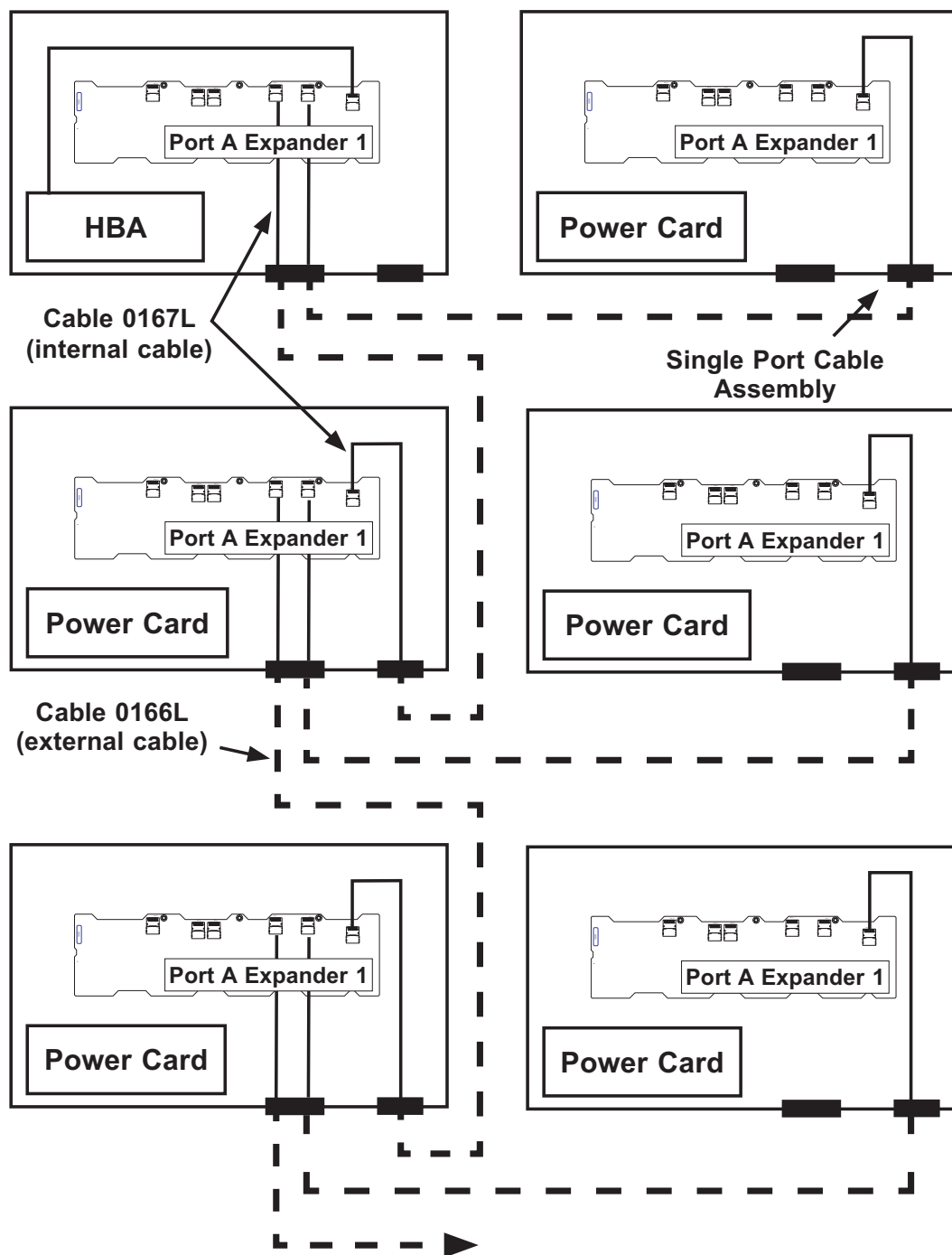


Figure 3-20: Cascaded Configuration with Horizontal Branching

Dual SAS HBA and Cascaded Configuration

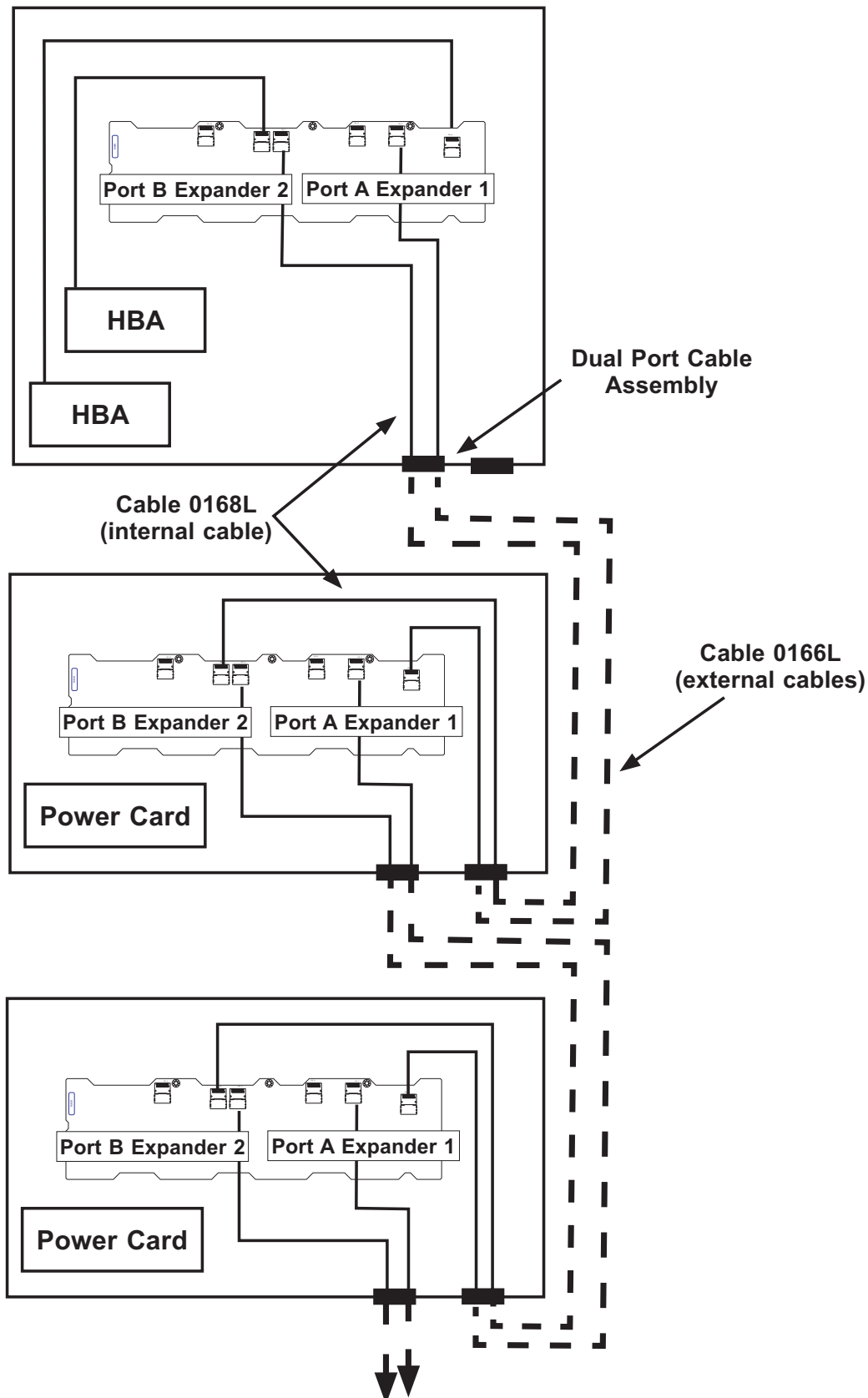


Figure 3-21: Dual SAS HBA with Cascaded Configuration

Dual SAS HBA with Cascaded Configuration and Branching

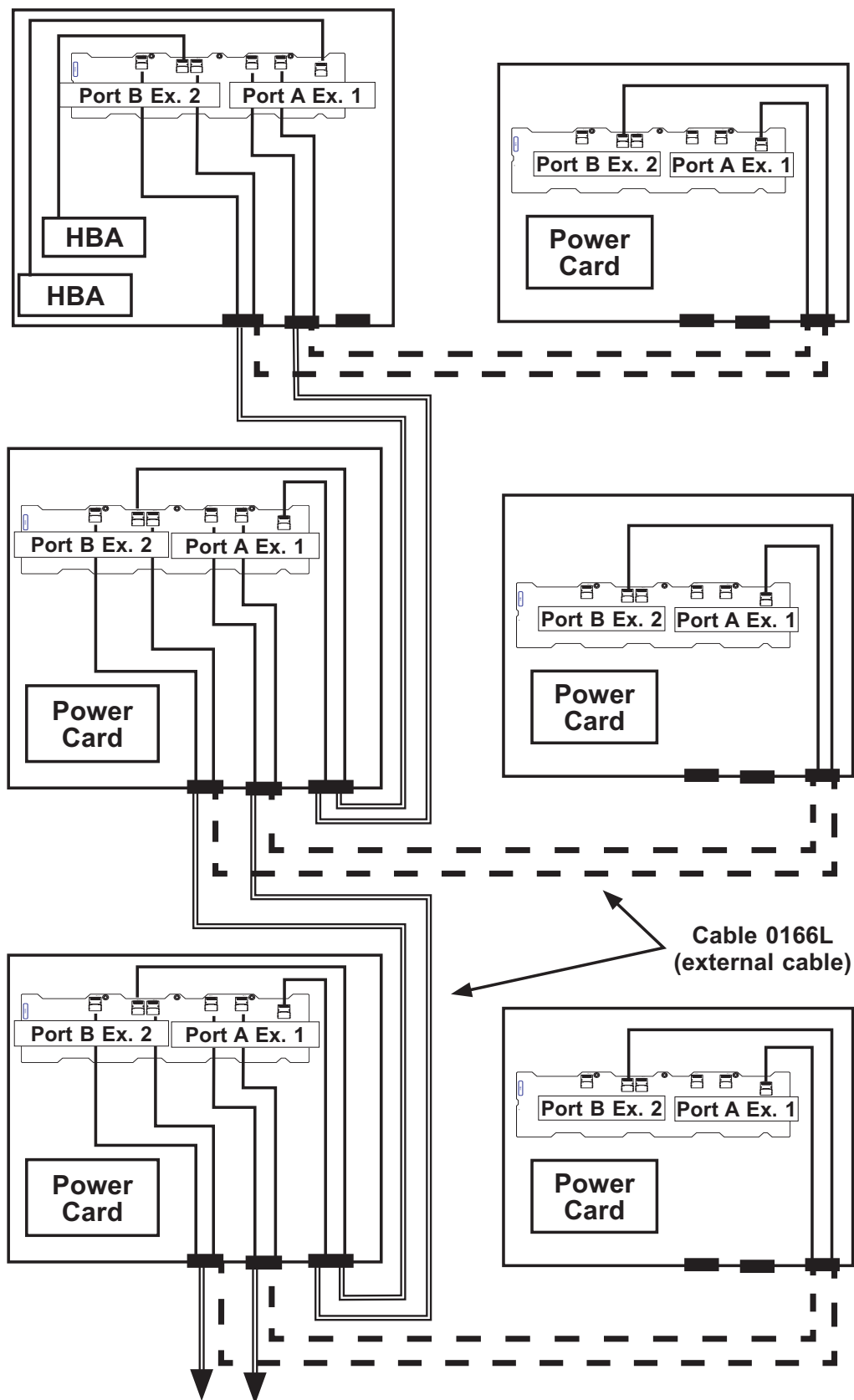


Figure 3-22: Dual SAS HBA with Cascaded Configuration and Branching

Notes